

WHAT IS CLAIMED IS:

1. A method for detecting radiation comprising:

forming a detector having a photocathode with a protective layer of cesium, oxygen and fluorine, a microchannel plate and an electron receiver for generating signals responsive to received electrons;

receiving radiation at the photocathode;

discharging electrons from the photocathode in response to the received radiation;

accelerating discharged electrons toward an input face of the microchannel plate;

receiving electrons at the input face of the microchannel plate;

generating secondary emission electrons in the microchannel plate in response to the received electrons;

emitting secondary emission electrons from the output face of the microchannel plate;

receiving secondary emission electrons at the electron receiver; and

producing an output characteristic of the received secondary emission electrons.

- 2. The method of claim 1, wherein the detected radiation is electromagnetic radiation having a wavelength within the range spanning from far infrared to ultraviolet.
- 3. The method of claim 1, wherein the detected radiation is visible light from an image and the output produced by the electron receiver is a representation of the image.

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- 4. The method of claim 1, wherein the electron receiver is a phosphor screen.
- 5. The method of claim 1, wherein the electron receiver is a charge coupled device (CCD).
 - 6. The method of claim 3, wherein the method is used for night vision devices.

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- 7. A device for detecting radiation comprising:
- a photocathode operable to receive radiation at an input side and to produce electrons at an output side in response to the received radiation, the output side of the photocathode having a protective layer comprising cesium, oxygen and fluorine;

a microchannel plate operable to receive electrons from the photocathode at an input face and to emit secondary emission electrons in response from an output face; and

an electron receiver operable to receive secondary emission electrons `and to produce an characteristic of the received secondary electrons.

- 8. The device of claim 7, wherein the received electromagnetic radiation having radiation is wavelength within the range spanning from far infrared to ultraviolet.
- 9. The device of claim 7,\ wherein the received radiation is visible light from an \backslash image and the output is a representation of the image.
- 25 The device of claim 9, wherein the device is used for night vision.
 - The device of claim 7, further comprising a 11. power supply operable to produce electric fields to accelerate electrons between components of the device.

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- 12. The device of claim 7, further comprising optics operable to focus radiation onto the photocathode.
- 13. The device of claim 7, wherein the microchannel plate has an unfilmed input face.
 - 14. The device of claim 7, wherein the electron receiver is a phosphor screen.
 - 15. The device of claim 7, wherein the electron receiver is a charge coupled device (CCD).

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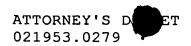
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16. A method of manufacturing a hardened photocathode comprising:

forming a photocathode having an input side for receiving photons and an output side for generating electrons in response to received photons;

exposing the output side of the photocathode to cesium;

exposing the output side of the photocathode to oxygen; and

exposing the output side of the photocathode to fluorine.

- 17. The method of claim 16, wherein the photocathode comprises a gallium arsenide (GaAs) or indium gallium arsenide (InGaAs) layer mounted upon a transparent substrate.
- 18. The method of claim 16, wherein the output side of the photocathode is exposed to cesium, oxygen and fluorine until the photoelectric response of the photocathode is maximized.
- 19. The method of claim 16, wherein the exposure of the photocathode to cesium, oxygen and fluorine comprises separate steps of exposure to cesium and exposure to a combination of oxygen and fluorine.
- 20. The method of claims 18, wherein the steps of exposure are iterated until the photoelectric response is maximized.